Response by PINES
On US Environmental Protection Agency
February 29, 2012, letter from
Matthew J. Ohl, Remedial Project Manager,
transmitting
Review of PINES 2009 Radiation Survey
And Resulting Risk Assessment

November 16, 2012

People in Need of Environmental Safety (PINES) appreciated the U.S. Environmental Protection Agency, Region 5 (USEPA5) review of their 2009 radiation survey in Pines, Indiana. Matthew J. Ohl, USEPA5 Remedial Project Manager, transmitted a contractor review on February 29, 2012. It is the PINES' understanding that USEPA5 has provided this review to the Northwestern Indiana Regional Planning Commission (NIRPC), Environmental Management Policy Committee (EMPC), and that it has been distributed to NIRPC EMPC members.

PINES has reviewed the USEPA5's contractor review and has clarifying comments. PINES requests that NIRPC EMPC distribute this PINES review to their NIRPC EMPC members as well.

PINES Response

1. USEPA5 engaged a contractor with over 30 years of experience in environmental radiation, who is a member of the Health Physics Society, and who is certified by the American Board of Health Physics.

   PINES relied on a member with similar credentials: 28 years experience in environmental radiation, a member of the Health Physics Society for his entire career, and certified by the American Board of Health Physics. This member, Larry Jensen, worked at Argonne National Laboratory for 2 years and for USEPA5 for 25 years. Most of the latter time he was either the Regional Radiation Expert or the Superfund Radiation Expert. He was also the Regional Radiation Risk Assessor. Mr. Jensen was a member of the Health Physics Society committee that produced the American National Standards Committee / Health Physics Society standard, "Control and Release of Technologically Enhanced Naturally Occurring Radioactive Material (TENORM)" [ANSI/HPS N13.53-2009]. TENORM may be the type of material associated with elevated radiation levels in the Town of Pines, Indiana.

2. PINES does not wish to debate a minor issue about who calibrated the radiation survey meter. The radiation survey meter used in the PINES 2009 survey was rented from Auxier and Associates, a highly reputable, long standing, radiation survey company, which would not have their instruments calibrated by any group they did not have full faith in. Moreover, Griffin Instruments calibration sheets state, "Calibrations performed to ANSI [American National Standards Institute]

N323A-1997 standards," and "NIST [National Institute of Standards and Technology] Traceable Equipment and Standards Used During Calibration." Fundamentally, the calibration should be legally defensible.

3. The USEPA5 reviewer admonished PINES for not calibrating to the radionuclides of interest. This is a disjoint criticism. At this time no one knows the identity of the material giving elevated radiation readings in Pines. If and when these radionuclides are identified it may be appropriate to develop a more specific calibration.

   Calibration with cesium-137 is appropriate for an initial, exploratory, survey of this type and, in fact, it is common procedure. With cesium-137 there is a single, well defined, strong, gamma emission energy that can be correlated well with meter electronics. If radium-226 had been used, for example, there are so many gamma-ray emissions that there would be confusing interference.

4. There are many reasons that calibration with the Illinois Emergency Management Agency (IEMA) radium blocks is inappropriate. Namely:

   (a) The material in the Town of Pines is not known to be radium. The causative material there has not been identified.

   (b) The sources used by IEMA are not calibration sources. They are intended to establish a relationship between field meter readings and cleanup concentrations so that cleanup decisions can be made immediately in the field rather than using time-consuming and expensive laboratory measurements. Mr. Jensen knows this well because he was part of the decision making group at USEPA5 that authorized use of these sources.

   (c) It is not likely that a citizens group in Indiana would be granted access to a regulator's sources in Illinois.

   (d) If Illinois allowed access to their sources, it is probable PINES could not afford a fee.

5. The USEPA5 reviewer makes the following statement, "The survey does not include the type of analysis necessary to identify the radionuclides that might be present and the data presented in the Survey do not demonstrate that any specific radionuclides are present at concentrations distinct from background."

   PINES appreciates this statement from the reviewer as it agrees with the requests PINES has been making to USEPA5 since 2009.

   (a) The meter selected was a seek-and-find instrument. It can find elevated radiation areas by a change in meter count rate. This is appropriate for a gross

scan to locate radioactive material when the emitting radionuclides are not known.

(b) The meter used cannot identify the causative radionuclides. This is not a flaw but simply a characteristic of seek-and-find instruments. Identifying the radionuclides requires lab analysis from collected samples. Lab analyses can identify the radionuclide isotopes present and establish their concentrations.

(c) PINES was well aware they did not have the financial resources to have lab analyses done. The most they could do was to establish there were unusual levels of radioactivity at locations identified by the NIPSCO and Brown contractors as visually showing "Suspected CCBs" (Coal Combustion Byproducts) [see Figure 3-18 below]. In the PINES survey, elevated radiation levels were always associated with black, glittery material that is similar to bottom ash, a CCB. However, at this stage of data, there is no confirmation that there are CCBs or bottom ash present. The causative material may be something entirely different. This needs further investigation.

(d) The best way to respond to this comment is for USEPA5 to collect samples and have them analyzed as PINES requested in 2009.

6. Initially, it should be explained that the natural environment, principally in rocks and soils, contains radioactive materials, mostly related to series of uranium and thorium isotopes and a single potassium isotope. These vary regionally and locally. Before initiating a survey, it is necessary to establish a radiation background in proximity of the site being investigated. This is commonly done, and was done by PINES, by selecting several areas that appear to be untainted within or near the region of interest and doing repetitive counts at a single spot in each area. PINES chose 3 background sites, one in an open grassy area and two in the woods. The detector was set on the ground and three separate 2-minute counts were made without moving the meter. 2-minute counts were made to provide an average since normal radiation levels fluctuate.

   PINES wishes to clarify how measurements were made at background sites as it seems the USEPA5 reviewer substantially misunderstood the process. Each of the three background sites was walked to gain a general idea of the levels and range of variation present. Count rates fell mostly into two groups, those about 3000 – 5000 counts per minute (cpm) and those about 10,000 cpm and above. The higher count rates were always associated with black glittery material. PINES was apprehensive that the black glittery material might be a contaminant and, thus, these areas did not represent untainted, natural environmental levels. No background measurements were taken where black glittery material was present. Background measurements were taken only in the low range areas. Thus, the report, to be comprehensive, stated all data measured in the area, but background measurements were only made where no black, glittery material was present.

Having established background, a statistical test for readings out of the background range can be used. When readings are more than twice background, the reading can no longer be assumed to be within the statistical range of background fluctuations.

Again, PINES appreciates the admonition by the USEPA5 reviewer, “Analysis of samples is necessary to determine radionuclide identity and if concentrations are present above background concentrations.” PINES could not agree more and has been seeking this assistance from USEPA5 for three years.

7. Because the USEPA5 reviewer misunderstood the background data (explained above) the comment that the data for the investigation sites falls within the range for the background sites is incorrect.

   It should be noted, and this is reasonable, not all investigation sites showed elevated radiation levels.

8. PINES does not know the nature of the material causing elevated radiation readings. This is something PINES has sought assistance from USEPA5 to determine but we have not gotten that assistance as yet.

   Because investigation sites where readings were above twice background were always associated with a black, glittery, material, it is assumed this material might contain the excess radioactivity.

   Because bottom ash is a black, glittery, material it is reasonable to presume that the black, glittery, material at investigation sites is bottom ash.

   All the investigation sites where black, glittery, material was found are also associated with the visual identification of CCBs by ENSR, the contractor for the Potentially Responsible Parties, NIPSCO and Brown (see Figure 3-18 below).

   With the assistance of the USEPA5, the above observations could be validated or invalidated.

9. It is incorrect to say “The range of radiation levels in investigation areas never exceeded double the range of values observed in background areas,…” The average background level was 4722 cpm. Twice this is 9444. Investigation area levels ranged reached as high as 13,540 cpm (2 minute count).

10. It is correct that the survey did not explore human health pathways and establish risk levels. The purpose of the survey was only to determine if radioactive material was present. Indeed, results indicate elevated radiation levels. The necessary follow through should be to determine if a human health hazard is present.

PINES separately attempted a human health risk assessment since Mr. Jensen had that role when he was employed by USEPA5. This was made very difficult by the lack of concentration data for the critical radionuclides in the Town of Pines. Only a few data were present from Yard 520 and that made for, admittedly, a weak risk assessment. If USEPA5 would assist in identifying the radionuclides in areas of elevated count rate and in establishing their concentrations, PINES feels a firm risk assessment could be accomplished. It should be recalled that the former Yard 520 USEPA5 remedial project manager, Tim Drexler, promised to use the maximum data for this assessment.

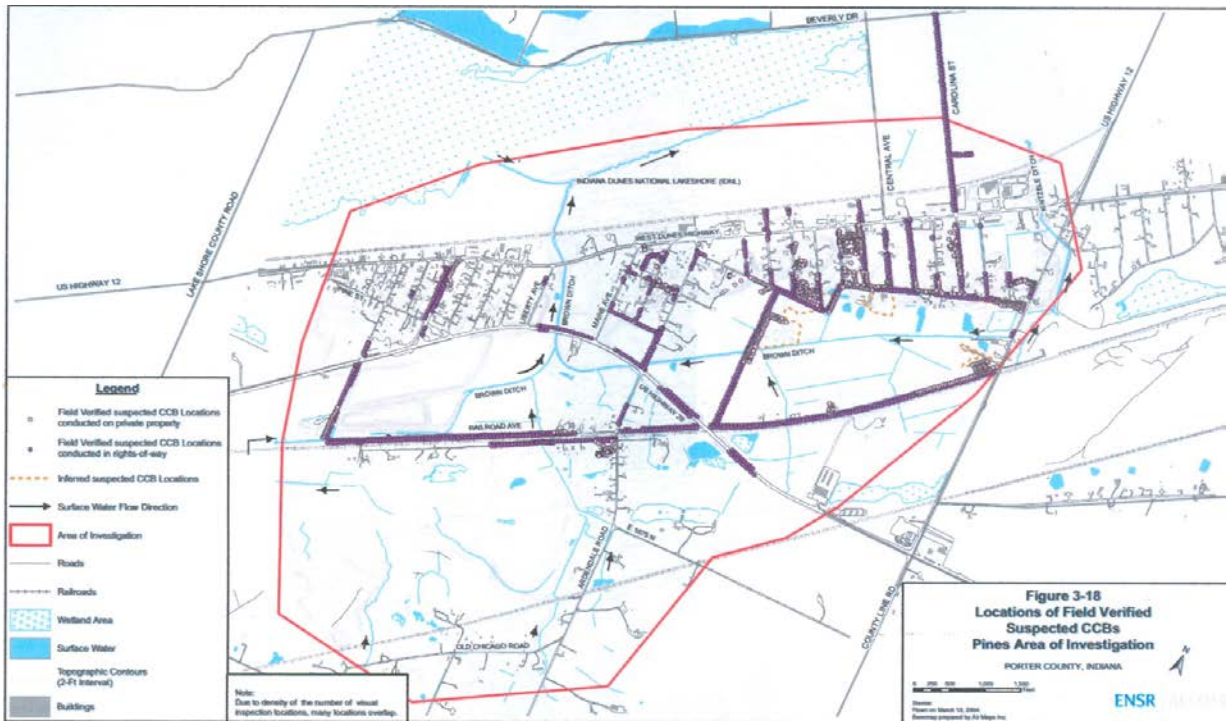
11. PINES acknowledges that a typo was made in quoting the regulation. As the reviewer states, the regulation is in Title 40, Part 192, not Title 10.

    No data is available on soil concentrations in areas in the Town of Pines where NIPSCO's and Brown's contractor, ENSR, visually identified CCBs. At least two samples from Yard 520 (and there is little of this data) as discussed in the HHRA (Human Health Risk Assessment) exceed the levels of 5 picocuries per gram plus background, total radium, cleanup criterion of Title 40, Part 192.12. It is not unreasonable to project there may be soil exceeding this criterion in the Town of Pines. The only way to confirm or refute this is for soil samples to be taken and analyzed. USEPA5 and/or the Indiana Department of Homeland Security and the Indiana State Board of Health have the resources to do this.

12. With regard to drinking water measurements, USEPA5 stated on that it intended to assure water in the Town of Pines met the USEPA drinking water standards. USEPA drinking water standards, in Title 40, Part 141.55, specify radioactivity levels. These must be part of the drinking water measurements.

13. PINES found that a risk assessment at this stage of data availability was difficult. If USEPA5 will obtain data in the Town of Pines, from the areas of elevated count rate, on the radionuclides present and their concentrations, a solid risk assessment should be feasible.

14. PINES has no further comments on the review of Enclosure 2 for PINES Radiation Risk Estimate.


BEVERLY DR
INDIANA DUNES NATIONAL LAKESHORE (ENL)
US HIGHWAY 12
LAKE SHORE COUNTY ROAD
CENTRAL AVE
CAROLINA ST
US HIGHWAY 12
WEST DUNES HIGHWAY
LIBERTY AVE
MAINE AVE
BROWN DITCH
BROWN DITCH
BROWN DITCH
RAILROAD AVE
US HIGHWAY 12
HIGHLANDS ROAD
OLD CHICAGO ROAD
COUNTY LINE RD
Legend
Field Verified suspected CCB Locations conducted on private property
Field Verified suspected CCB Locations conducted in rights-of-way
Inferred suspected CCB Locations
Surface Water Flow Direction
Area of Investigation
Roads
Railroads
Wetland Area
Surface Water
Topographic Contours (2-Ft Interval)
Buildings
Note:
Due to density of the number of visual inspection locations, many locations overlap.
Figure 3-18
Locations of Field Verified Suspected CCBs
Pines Area of Investigation
PORTER COUNTY, INDIANA
ENSR